

App. No. 09/998,001
Response After Final Dated June 4, 2004
Reply to final Office Action of April 8, 2004

REMARKS

Currently, claims 1-8, 10-19, 41-46 and 58-59 remain pending in the present application, including independent claims 1 and 14. In general, the claims are directed to an elastic film that contains a thermoplastic polyurethane elastomer and a filler. The film has been stretched an amount sufficient to form micropores adjacent to the filler particles. In the latest Office Action, independent claims 1 and 14 were rejected under 35 U.S.C. § 102 or under 35 U.S.C. § 103 in view of U.S. Patent No. 5,445,862 to Kaneko. Independent claim 1 was also rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,245,401 to Ying. In response, it is believed that claims 1 and 14 patentably define over the cited references as discussed in greater detail below.

As stated throughout the specification, the present invention is directed to microporous films made from polyurethane elastomers that have the heat and fabrication characteristics of a conventional thermoplastic and the performance properties of a conventional thermoset rubber. The thermoplastic polyurethane elastomers are multi-block polymers that contain hard segments and soft segments. At room temperature, the low melting soft segments are incompatible with the polar hot melting hard segments, which causes microphase separation. Upon heating above the melting temperature of the hard segments, the polymer forms a homogeneous viscous melt, which can be processed by thermoplastic techniques. Subsequent cooling, however, leads to segregation of the hard and soft segments.

The properties of the polyurethane elastomers are affected by hard and soft segment domain morphology. In particular, the mechanical elastic properties of thermoplastic polyurethane elastomers are related to the time-dependent formation of domain morphology. Therefore, post-curing of a thermoplastic polyurethane elastomer after thermoformation can be done in order to obtain optimal properties.

According to the present invention, a film is formed consisting essentially of a polyurethane elastomer and a filler. More specifically, as stated on page 11, the present invention is directed to the use of thermoplastic polyurethane elastomers that

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can be filled with a filler, formed into a film, stretched to form micropores, and thereafter cured where a substantial portion of most of the phase separation occurs. Using materials as described above not only provides processing advantages but allows the film to recover a substantial amount of elasticity that otherwise would be lost.

Independent claim 1 defines an elastic film that consists essentially of a thermoplastic polyurethane elastomer and a filler. As stated in the previous remarks, according to section 2111.03 of the Manual of Patent Examining Procedure, the phrase "consisting essentially of" is typically used and defined in the context of compositions and limits the scope of a claim to the specified materials or steps and those that do not materially affect the basic and novel characteristics of the claimed invention. Therefore, claim 1 requires the basic and novel characteristics of the invention to be derived from a thermoplastic polyurethane elastomer and a filler.

On the other hand, Kaneko is directed to the formation of films made primarily from an ethylene- α -olefin copolymer. The ethylene- α -olefin copolymer is combined with a thermoplastic elastomer. As taught in Kaneko, the ethylene- α -olefin copolymer is a necessary and primary ingredient of the film and is present in the film in an amount of at least 65% by weight. The inclusion of an ethylene- α -olefin copolymer in an amount suggested by Kaneko substantially changes the novel or basic characteristics of Applicant's invention.

For instance, since an ethylene- α -olefin copolymer has different properties than the polyurethane elastomers used in the present invention, Applicant asserts that the addition of an ethylene- α -olefin in such great amounts would change the novel characteristics of the claimed invention. For example, as described above, the domain morphology of thermoplastic polyurethane elastomers contribute to the mechanical elastic properties of films made according to the present invention. Incorporated into the film an ethylene- α -olefin polymer in an amount of at least 65% by weight significantly dilutes the ability of the polyurethane elastomers to control the elastic properties of the product.

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Further, Kaneko in fact teaches away from the elastic films defined in the present claims. For instance, Kaneko states, "when the copolymer is less than 65% by weight and the elastomer exceeds 35% by weight, the stretching of the resulting mixture is difficult, causing rupture during the stretching and making large the dimensional shrink after the stretching." (Col. 5, lines 28-32) Kaneko states a film formed primarily from an elastomer and containing a smaller amount of a copolymer, such as an ethylene- α -olefin, as the Examiner is suggesting, has inferior properties. Kaneko confirms that the addition of an ethylene- α -olefin copolymer changes the properties of the film. Therefore, a product formed primarily from a thermoplastic elastomer is distinct over a product formed primarily of an ethylene- α -olefin copolymer.

In the Office Action, the Examiner states, "It appears that the stabilizer as a second filler is included in the claim" and asks why then a second elastic polymer film material is not included by the claim. To begin with, a stabilizer is a minor component, which is incorporated in the film in very small amounts. The stabilizer does not change the physical properties of the present invention. Further, the stabilizer does not act as a filler creating micropores in the film. Primarily, the stabilizer is present to protect the polymer component during processing, heating, aging and the like and does not affect the basic and novel characteristics of the claimed invention.

In the Office Action, claim 1 was also rejected under 35 U.S.C. § 102(e) in view of Ying. Ying is directed to segmented conformable breathable films. In contrast to the currently pending claims, however, Ying fails to disclose a thermoplastic polyurethane elastomer film that contains a filler and has been stretched in amounts sufficient to form micropores adjacent to the filler particles. Therefore, Ying fails to anticipate claim 1.

More particularly, Ying does disclose microporous stretched films containing a filler and does disclose elastomeric polyurethanes. **Contrary to the presently pending claims, however, nowhere does Ying specifically disclose a filler-filled elastomeric polyurethane film.** For example, when Ying discusses filler-filled films, Ying states that the films are made from materials, such as LLDPE (linear low density

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polyethylene) (see column 10). When specifically discussing the use of elastomeric polyurethanes, however, Ying states that the films are breathable but non-porous. "Non-porous" refers to the fact that the polyurethanes are inherently breathable without containing filler particles and being stretched to form micropores. For instance, the Examiner's attention is particularly directed to Table 2 in Example 1 of the present application. Sample Nos. 1, 6 and 12 in Table 2 represent polyurethane elastomeric films that do not contain a filler. As shown, the films are still breathable as indicated by the WVTR data.

Thus, since Ying fails to specifically disclose a thermoplastic polyurethane elastomer film containing a filler, Applicant submits that Ying fails to anticipate claim 1.

Independent claim 14 in the present application was also rejected in view of Kaneko. Claim 14 is directed to an elastic film that contains an elastic polymer film material and the filler. The elastic polymer film material consists of a thermoplastic polyurethane elastomer. Due to the inclusion of the phrase "consists of" claim 14 excludes the use of other polymeric film materials in forming the elastic film.

As opposed to claim 14, instead of being formed from an elastic polymer film material that consists of a thermoplastic polyurethane elastomer, Kaneko teaches forming the film from primarily an ethylene- α -olefin copolymer. Thus, Kaneko fails to disclose or suggest forming the film from only a thermoplastic polyurethane elastomer as the film forming material. In fact, Kaneko states in column 5 that the elastic film is formed from two components that "must be" such that the ethylene- α -olefin copolymer is 65-90% by weight. Thus, Kaneko makes clear that the elastic films disclosed therein and the properties that are obtained are only possible through the use of at least two polymeric film-forming components. Therefore, for at least the reasons listed above, it is believed claim 14 patentably defines over Kaneko.

In view of the foregoing discussion, Applicants respectfully request reconsideration and re-examination of the pending application and the timely allowance of pending claims. Applicants respectfully submit that the claims are patentably distinctive over the prior art of record. Applicants believe that the present application is

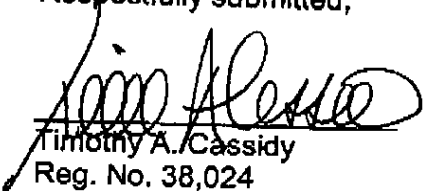
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in complete condition for allowance and favorable action, therefore, is respectfully requested.

Examiner Vo is invited and encouraged to telephone the undersigned should any issues remain after consideration of this response. Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

Respectfully submitted,

6/4/04
Date


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